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persons, and means of conferring artificial immunity against poliomyelitis.

At present our information demands the employment of the following administrative procedures in attempting to control the disease:

1. The requirement that all recognized and suspected cases be promptly reported.
2. Isolation of patients in screened premises. The duration of infectivity being unknown, the period of isolation must necessarily be arbitrary. Six weeks has been recommended by the Conference of State and Territorial Health Officers with the Surgeon General of the Public Health Service as sufficient, and this period has been generally accepted throughout the United States.
3. Disinfection of all body discharges.
4. Restriction of the movements of intimate associates of the patient as far as practicable. This should include at least exclusion of the children of the family from schools and other gatherings.
5. Protection of children as far as possible from contact with other children or with the general public during epidemics.
6. Observation of contacts for two weeks after the last exposure.

There is no specific treatment of established value in poliomyelitis. During the persistence of the acute symptoms of the disease the important principles of treatment are rest in bed, symptomatic relief, and passive support for the prevention of deformities. Active measures during this stage are not only useless, but are apt to cause serious and often permanent injury. Hospitalization of patients where possible should be encouraged. The best chances of recovery from residual paralysis demand skillful aftercare, often long continued, and always under the direction of a physician familiar with the neurological and orthopedic principles of treatment. The provision of such aftercare often becomes a community problem, demanding the cooperation of all available agencies, social and professional.

FLY POISONS.

STUDIES ON SODIUM SALICYLATE, A NEW MUSCICIDE, AND ON THE USE OF FORMALDEHYDE.

By EARLE B. PHELPS, Professor of Chemistry, and ALBERT F. STEVENSON, Sanitary Chemist, United States Public Health Service.

[A digest of a forthcoming bulletin of the Hygienic Laboratory.]

In the general public health campaign for the eradication of the fly not the least important of the many destructive measures available are these capable of being employed within the household. These constitute in a measure the last line of defense and are aimed against those flies, relatively few in number, which have escaped such

general public measures as the elimination of breeding places, and that most important individual effort, effective screening. These measures, even when most successful, have not heretofore given entire protection and it has been necessary to supplement them with one or another form of destruction within the household itself.

For this purpose various devices are available, comprising, in general, poisoning, trapping, and swatting. Each of these various methods, while reasonably effective, has distinct disadvantages. The trapping of flies either in mechanical traps or upon sticky preparations, is an undesirable procedure by reason of its unsightliness and other unpleasant aspects. The practice of swatting, despite the faulty biological reasoning so often urged by its enthusiastic supporters, whereby the effectiveness of a single swat is multiplied many million fold, certainly does possess the advantage of a very definite 100 per cent efficiency. Its disadvantage lies chiefly in the effort and earnestness which it demands, factors which are apt to be affected by rising temperature inversely as the multiplication rate among the flies.

The poisoning of flies seems to possess, all told, the fewest disadvantages in proportion to its advantages, and were it not for the single fact that poisonous fly paper and preparations are quite generally known to contain arsenic, there is no doubt that their use would be greatly extended. That such use is attended with no small danger, especially among young children, has been freely commented upon in the medical and other literature of the past few years, and definite evidence of harmful and even fatal results is accumulating.

It has seemed quite desirable, therefore, to investigate this subject with special reference to the selection of some other substances which under ordinary conditions of use and of accidental or ignorant misuse would not be so dangerous to the health and lives of children and which at the same time would serve equally well, or better, for the destruction of flies. To this end, experiments have been conducted at the Hygienic Laboratory with a considerable number of possible muscicides.

Of the many substances investigated only two have been found to possess the requisite properties of safety and efficiency, i. e., formaldehyde and sodium salicylate.

Formaldehyde, in solutions of various strengths, has been recommended from time to time for this purpose. It has been found in the present study that the best results are obtained with a solution containing 1 per cent of the formaldehyde, or $2\frac{1}{2}$ per cent of the 40 per cent solution, which is the form in which it is usually sold. Concentrations greater or less than this are less efficient, although the efficiency does not fall off very rapidly down to a half per cent

solution. Solutions stronger than 1 per cent apparently repel the flies by their odor, although there is evidence that the odor of the 1 per cent solution is slightly attractive—that is, the flies prefer it to plain water. It is probable that the unsatisfactory results that have sometimes followed the use of this material have been due to the use of solutions of improper strength. A valuable property of this muscicide brought out by this study is that, whereas at summer temperature it is somewhat less efficient than commercial arsenic preparations, its loss of efficiency with decreasing temperature is much less and its relative value, therefore, correspondingly greater. During the cooler days of fall, at which time the greatest difficulty is experienced in keeping the flies out of the home, this preparation compares most favorably with the arsenic papers.

Sodium salicylate has not, so far as we are aware, been previously recommended as a muscicide. In 1 per cent solution it is slightly less efficient than the formaldehyde, but it possesses certain marked advantages, especially for household use. It is a less objectionable substance to have about the house in concentrated form, is a solid which does not lose its strength, and in the preparation of the solution it is not of so great importance that the exact strength recommended be adhered to. Furthermore, it lends itself to preparation and sale in the form of papers in much the same way that arsenic papers are now put up. Like formaldehyde, it does not lose efficiency at lower temperatures nearly so rapidly as do the arsenic preparations.

For household use these solutions may be prepared by the addition of 3 teaspoonfuls of either the 40 per cent solution of formaldehyde found on the market or the powdered sodium salicylate to a pint of water. Nearly fill a glass tumbler with the solution, place over this a piece of blotting paper cut to circular form and somewhat larger in diameter than the tumbler, and over this invert a saucer. Invert the whole device and insert a match or toothpick under the edge of the tumbler to allow access of air. The blotting paper will remain in the proper moist condition until the entire contents of the tumbler have been used and the strength of the formaldehyde solution will be maintained. A little sugar sprinkled upon the paper will increase the attractiveness of the poison for the flies. Either of these preparations may be safely used where there are young children, although the addition of the sugar is not recommended in such cases. The formaldehyde, unlike arsenic preparations, has an unpleasant taste, and in the concentrations recommended a harmful dose could not conceivably be taken. No bad effects would result from the consumption of a considerable quantity of the salicylate.